SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

<table>
<thead>
<tr>
<th>Product form</th>
<th>: Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>: Liquid</td>
</tr>
<tr>
<td>Substance name</td>
<td>: POLY(OCTYLENEGLYCOLTITANATE)</td>
</tr>
<tr>
<td>Product code</td>
<td>: PTI-008</td>
</tr>
<tr>
<td>Formula</td>
<td>: ([\text{OCH}_2\text{CHEt(CH}_2\text{)}_4\text{OTi(CH}_2\text{CHEt(CH}_2\text{)}_4\text{OH})_2]_n)</td>
</tr>
<tr>
<td>Synonyms</td>
<td>: 2-ETHYL-1,3-HEXANEDIOL TITANATE POLYMER; TETRAKIS(2-ETHYLHEXANE-1,3-DIOLATO)TITANIUM; TITANIUM, TETRAKIS(2-ETHYL-1,3-HEXANEDIOLATO)</td>
</tr>
<tr>
<td>Chemical family</td>
<td>: METAL ESTER</td>
</tr>
</tbody>
</table>

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Use of the substance/mixture : Chemical intermediate

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

GELEST INC.
Fritz-Klatte-Strasse 8
65933 Frankfurt
Germany
T +49 (0) 69 3535106 - F +49 (0) 69 3535106-501 - (M-F): 8:00 AM - 4:00 PM
info@gelestde.com - www.gelestde.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

- Flammable liquids, Category 3 : H226
- Serious eye damage/eye irritation, Category 2 : H319

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

- GHS02
- GHS07

Signal word (CLP) : Warning

Hazard statements (CLP) :

- H226 - Flammable liquid and vapour.
- H319 - Causes serious eye irritation.

Precautionary statements (CLP) :

- P280 - Wear protective gloves;protective clothing;eye protection;face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 - Ground/bond container and receiving equipment.
P264 - Wash hands thoroughly after handling.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.

2.3. Other hazards
Other hazards not contributing to the classification:
Additional n-butanol may be formed by reaction with moisture and water. The US OSHA PEL (TWA) for n-butanol is 100 ppm. The US ACGIH (TWA) for n-butanol is 20 ppm.

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly(octylene glycol titanate)</td>
<td>(CAS-No.) 5575-43-9</td>
<td>90-100</td>
<td>Flam. Liq. 3, H226 Eye Irrit. 2, H319</td>
</tr>
<tr>
<td></td>
<td>(EC-No.) 226-949-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

3.2. Mixtures
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

| First-aid measures general | Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label. |
| First-aid measures after inhalation | Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice. |
| First-aid measures after skin contact | Wash with plenty of water/…. Get medical advice/attention. |
| First-aid measures after eye contact | Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention. |
| First-aid measures after ingestion | Never give anything by mouth to an unconscious person. Get medical advice/attention. |

4.2. Most important symptoms and effects, both acute and delayed

| Symptoms/effects after inhalation | May cause irritation to the respiratory tract. |
| Symptoms/effects after skin contact | May cause skin irritation. |
| Symptoms/effects after eye contact | Causes serious eye irritation. |
| Symptoms/effects after ingestion | No information available. |

4.3. Indication of any immediate medical attention and special treatment needed

Note to physician: Activated charcoal slurry may be administered. Activated charcoal slurry is prepared by suspending 50 grams of activated charcoal in 400 ml water and mixing thoroughly. Administer 5 ml/kg.

SECTION 5: Firefighting measures

5.1. Extinguishing media

| Unsuitable extinguishing media                    | Do not use straight streams. |

5.2. Special hazards arising from the substance or mixture

| Fire hazard | Flammable liquid and vapour. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame. |

5.3. Advice for firefighters

| Firefighting instructions | Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers. |
| Protection during firefighting | Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist. |
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Eliminate ignition sources. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment as described in Section 8.
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapour and mist. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only in well ventilated areas. Use only non-sparking tools.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.
Storage conditions: Keep container tightly closed. Keep in a cool place.
Storage area: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls:
Provide local exhaust or general room ventilation.

Personal protective equipment:
Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:
Neoprene or nitrile rubber gloves

Eye protection:
Chemical goggles. Contact lenses should not be worn

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

**SECTION 9: Physical and chemical properties**

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear liquid. Viscous.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>482.54 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>Pale yellow.</td>
</tr>
<tr>
<td>Odour</td>
<td>Mild.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>No additional information available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butylacetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>1700 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>50 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt; 0.5 mm Hg @ 20°C</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.035</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>1700 cSt</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information

No additional information available

**SECTION 10: Stability and reactivity**

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

Material decomposes slowly in contact with moist air or with water liberating 2-ethyl-1,3-hexanediol.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Organic acid vapors. Titanium oxide.

**SECTION 11: Toxicological information**

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
POLY(OCTYLENEGLYCOLTITANATE)
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Carcinogenicity: Not classified
Reproductive toxicity: Not classified
STOT-single exposure: Not classified
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified
Potential adverse human health effects and symptoms: This compound liberates n-butanol on contact with moisture. Material generates n-butanol on contact with water or moisture in skin, eyes and mucous membranes and has an irritating, dehydrating effect on overexposed tissue.
Symptoms/effects after inhalation: May cause irritation to the respiratory tract.
Symptoms/effects after skin contact: May cause skin irritation.
Symptoms/effects after eye contact: Causes serious eye irritation.
Symptoms/effects after ingestion: No information available.
Reason for classification: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Acute aquatic toxicity: Not classified
Chronic aquatic toxicity: Not classified

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

12.4. Mobility in soil
No additional information available

12.5. Results of PBT and vPvB assessment
No additional information available

12.6. Other adverse effects
Other adverse effects: This substance may be hazardous to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Sewage disposal recommendations: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations: Incinerate. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number
In accordance with ADR / RID / IMDG / IATA / ADN

14.2. UN proper shipping name
Proper Shipping Name (ADR): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (IMDG): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (IATA): Flammable liquid, n.o.s.
Proper Shipping Name (ADN): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (RID): FLAMMABLE LIQUID, N.O.S.
Transport document description (ADR): UN 1993 FLAMMABLE LIQUID, N.O.S. (POLY(OCTYLENEGLYCOLTITANATE)), 3, III, (D/E)
Transport document description (IMDG): UN 1993 FLAMMABLE LIQUID, N.O.S. (POLY(OCTYLENEGLYCOLTITANATE)), 3, III
Transport document description (IATA): UN 1993 Flammable liquid, n.o.s. (POLY(OCTYLENEGLYCOLTITANATE)), 3, III
Transport document description (ADN): UN 1993 FLAMMABLE LIQUID, N.O.S. (POLY(OCTYLENEGLYCOLTITANATE)), 3, III
## POLY(OCTYLENEGLYCOLTITANATE)
### Safety Data Sheet

**Transport document description (RID)**: UN 1993 FLAMMABLE LIQUID, N.O.S. (POLY(OCTYLENEGLYCOLTITANATE)), 3, III

<table>
<thead>
<tr>
<th>14.3. Transport hazard class(es)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADR</strong></td>
<td></td>
</tr>
<tr>
<td>Transport hazard class(es) (ADR) : 3</td>
<td></td>
</tr>
<tr>
<td>Danger labels (ADR) : 3</td>
<td></td>
</tr>
<tr>
<td><strong>IMDG</strong></td>
<td></td>
</tr>
<tr>
<td>Transport hazard class(es) (IMDG) : 3</td>
<td></td>
</tr>
<tr>
<td>Danger labels (IMDG) : 3</td>
<td></td>
</tr>
<tr>
<td><strong>IATA</strong></td>
<td></td>
</tr>
<tr>
<td>Transport hazard class(es) (IATA) : 3</td>
<td></td>
</tr>
<tr>
<td>Danger labels (IATA) : 3</td>
<td></td>
</tr>
<tr>
<td><strong>ADN</strong></td>
<td></td>
</tr>
<tr>
<td>Transport hazard class(es) (ADN) : 3</td>
<td></td>
</tr>
<tr>
<td>Danger labels (ADN) : 3</td>
<td></td>
</tr>
<tr>
<td><strong>RID</strong></td>
<td></td>
</tr>
<tr>
<td>Transport hazard class(es) (RID) : 3</td>
<td></td>
</tr>
<tr>
<td>Danger labels (RID) : 3</td>
<td></td>
</tr>
</tbody>
</table>

### 14.4. Packing group

| Packing group (ADR) | III |
| Packing group (IMDG) | III |
| Packing group (IATA) | III |
| Packing group (ADN) | III |
| Packing group (RID) | III |

### 14.5. Environmental hazards

| Dangerous for the environment | No |
| Marine pollutant | No |
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport
Classification code (ADR) : F1
Special provisions (ADR) : 274, 601, 640E
Limited quantities (ADR) : 5l
Excepted quantities (ADR) : E1
Packing instructions (ADR) : P001, IBC03, LP01, R001
Mixed packing provisions (ADR) : MP19
Portable tank and bulk container instructions (ADR) : T4
Portable tank and bulk container special provisions (ADR) : TP1, TP29
Tank code (ADR) : LGBF
Vehicle for tank carriage : FL
Transport category (ADR) : 3
Special provisions for carriage - Packages (ADR) : V12
Special provisions for carriage - Operation (ADR) : S2
Hazard identification number (Keilner No.) : 30
Orange plates : 30

Tunnel restriction code (ADR) : D/E

- Transport by sea
Special provisions (IMDG) : 223, 274, 955
Limited quantities (IMDG) : 5 L
Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P001, LP01
IBC packing instructions (IMDG) : IBC03
Tank instructions (IMDG) : T4
Tank special provisions (IMDG) : TP1, TP29
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-E
Stowage category (IMDG) : A

- Air transport
PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y344
PCA limited quantity max net quantity (IATA) : 10L
PCA packing instructions (IATA) : 355
PCA max net quantity (IATA) : 60L
CAO packing instructions (IATA) : 366
CAO max net quantity (IATA) : 220L
Special provisions (IATA) : A3
ERG code (IATA) : 3L

- Inland waterway transport
Classification code (ADN) : F1
Special provisions (ADN) : 274, 601, 640E
Limited quantities (ADN) : 5 L
Excepted quantities (ADN) : E1
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 0
POLY(OCTYLENEGLYCOLTITANATE)
Safety Data Sheet

- Rail transport
Classification code (RID) : F1
Special provisions (RID) : 274, 601, 640E
Limited quantities (RID) : 5L
Exempted quantities (RID) : E1
Packing instructions (RID) : P001, IBC03, LP01, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T4
Portable tank and bulk container special provisions (RID) : TP1, TP29
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 3
Special provisions for carriage – Packages (RID) : W12
Colis express (express parcels) (RID) : CE4
Hazard identification number (RID) : 30

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations
No REACH Annex XVII restrictions
POLY(OCTYLENEGLYCOLTITANATE) is not on the REACH Candidate List
POLY(OCTYLENEGLYCOLTITANATE) is not on the REACH Annex XIV List
POLY(OCTYLENEGLYCOLTITANATE) is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

15.1.2. National regulations

Germany
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands
SZW-lijst van kankerverwekkende stoffen : The substance is not listed
SZW-lijst van mutagene stoffen : The substance is not listed
NIET-eliminatie lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed
NIET-eliminatie lijst van voor de voortplanting giftige stoffen – Vuchtbaarheid : The substance is not listed
NIET-eliminatie lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

Denmark
Class for fire hazard : Class II-1
Store unit : 5 liter
Classification remarks : R10 -H226; H319-; Emergency management guidelines for the storage of flammable liquids must be followed

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Abbreviations and acronyms:
POLY(OCTYLENEGLYCOLTITANATE)
Safety Data Sheet

Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

| Eye Irrit. | Serious eye damage/eye irritation, Category 2 |
| Flam. Liq. | Flammable liquids, Category 3 |
| H226      | Flammable liquid and vapour. |
| H319      | Causes serious eye irritation. |

SDS EU (REACH Annex II) - Custom

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